

IN THE CLAIMS: /

Please CANCEL claims 14-24, 27-33, 36 and 37 without prejudice to or disclaimer of the recited subject matter.

Please AMEND claims 1, 7, 9, 12, 13, 25, 26, 34, 42, 46, 47, 50 and 51, and ADD new claims 52 and 53, as follows. For the Examiner's convenience, all claims currently pending in this application have been reproduced below:

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1. (Currently Amended) A supporting structure for supporting an optical element, said supporting structure comprising:

a first supporting member for supporting the optical element;

a second supporting member arranged in ~~the~~ an outer diameter side of the first supporting member for supporting the first supporting member; and

an elastic member placed between the first supporting member and the second supporting member in the radial direction of the optical element, ~~the~~ an inner diameter side of the elastic member being connected to the first supporting member while ~~the~~ an outer diameter side of the elastic member being connected to the second supporting member, the elastic member being elastically deformable in the radial ~~direction~~;

~~wherein the first supporting member does not contact the second supporting member in the axial direction.~~

2. (Original) A structure according to Claim 1, wherein the value of the thermal expansion coefficient of the first supporting member is between those of the optical element and the second supporting member.

3. (Original) A structure according to Claim 1, wherein the thermal expansion coefficient difference between the optical element and the first supporting member is smaller than the thermal expansion coefficient difference between the optical element and the second supporting member.

4. (Original) A structure according to Claim 3, wherein the optical element is made from quartz and the first supporting member is made from an alloy including nickel.

5. (Original) A structure according to Claim 3, wherein the optical element is made from quartz and the first supporting member is made from one of a cordierite ceramic material including magnesium oxide and silicon oxide, a ceramic material including alumina and silicon nitride, and Zerojule (TM) which is glass with low thermal expansion.

6. (Original) A structure according to Claim 3, wherein the optical element is made from fluorite and the first supporting member is made from an alloy including copper.

7. (Currently Amended) A structure according to Claim 3, wherein the optical element is made from fluorite and the first supporting member is made from one of an alloy of iron-chromium-nickel ~~such as 18-8 stainless steel~~ and an alloy including aluminum as a principal ingredient.

8. (Original) A structure according to Claim 1, wherein the values of the thermal expansion coefficient of the optical element, the first supporting member, and the second supporting member are substantially the same.

9. (Currently Amended) A supporting structure according to Claim 1 for supporting an optical element, said supporting structure comprising:

a first supporting member for supporting the optical element;

a second supporting member arranged in an outer diameter side of the first supporting member for supporting the first supporting member; and

an elastic member placed between the first supporting member and the second supporting member in the radial direction of the optical element, an inner diameter side of the elastic member being connected to the first supporting member while an outer diameter side of the elastic member being connected to the second supporting member, the elastic member being elastically deformable in the radial direction,

wherein the elastic member is a plate-shaped spring member in which both ends thereof are connected to the first supporting member and the central portion thereof is connected

to the second supporting member, and wherein a plurality of the plate-shaped spring members are arranged in a peripheral portion of the first supporting member at substantially equal intervals.

10. (Original) A structure according to Claim 1, wherein the elastic member is made from the same material as that of the first supporting member.

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11. (Original) A structure according to Claim 1, wherein the optical element is one of a lens, a mirror, and an optical element to which diffraction is applied.

12. (Currently Amended) An exposure apparatus comprising:  
an illuminating optical system for illuminating a reticle with a light beam from a light source; and  
a projection optical system for projecting a light beam from the reticle on a wafer,  
wherein at least one of the illuminating optical system ~~and/or~~ and the projection optical system have a supporting structure for supporting an optical element according to Claim 1.

13. (Currently Amended) A method for manufacturing semiconductor devices, said method and comprising:  
performing an exposing step by an exposure apparatus according to Claim 12.

14-24. (Cancelled)

25. (Currently Amended) An exposure apparatus comprising:

an illuminating optical system for illuminating a reticle with a light beam from a light source; and

a projection optical system for projecting a light beam from the reticle ~~on~~ onto a wafer,

wherein at least one of the illuminating optical system ~~and/or~~ and the projection optical system have a supporting structure for supporting an optical element according to Claim 14 9.

26. (Currently Amended) A method for manufacturing semiconductor devices, said method comprising:

performing an exposing step by an exposure apparatus according to Claim 25.

27-33. (Cancelled)

34. (Currently Amended) A supporting structure for supporting an optical element, said supporting structure comprising:

a plurality of optical elements;

a plurality of first supporting members for respectively supporting the plurality of optical elements; and

a plurality of second supporting members for respectively supporting the plurality of first supporting members via structures having elasticity in the radial direction of the optical element.

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35. (Original) A structure according to Claim 34, wherein the plurality of first supporting members do not contact each other.

36-37. (Cancelled)

38. (Original) A structure according to Claim 34, wherein the radial clearance between the optical element and the first supporting member is filled with adhesive along the whole circumference of the optical element.

39. (Original) A structure according to Claim 34, wherein the radial clearance between the optical element and the first supporting member is discontinuously filled with adhesive in a plurality of portions on the circumference of the optical element.

40. (Original) A structure according to Claim 34, wherein the thermal expansion coefficient of the first supporting member is an intermediate value between thermal expansion coefficient values of the optical element and the second supporting member.

41. (Original) A structure according to Claim 34, wherein thermal expansion coefficient values of the optical element, the first supporting member, and the second supporting member are substantially the same.

42. (Currently Amended) A structure according to Claim 34, wherein the thermal expansion difference between the optical element and the first supporting member is ~~smaller~~ less than the thermal expansion difference between the optical element and the second supporting member.

43. (Original) A structure according to Claim 34, wherein the optical element is made from quartz and the first supporting member is made from an alloy including nickel.

44. (Original) A structure according to Claim 34, wherein the optical element is made from quartz and the first supporting member is made from one of a cordierite ceramic material comprising magnesium oxide and silicon oxide, a ceramic material comprising alumina and silicon nitride, and Zerodur (TM) which is glass having low thermal expansion.

45. (Original) A structure according to Claim 34, wherein the optical element is made from fluorite and the first supporting member is made from an alloy including copper.

46. (Currently Amended) A structure according to Claim 34, wherein the optical element is made from fluorite and the first supporting member is made from one of an alloy of iron-chromium-nickel ~~such as 18-8 stainless steel~~ and an alloy including aluminum as a principal ingredient.

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47. (Currently Amended) A supporting structure according to Claim 34 for supporting an optical element, said supporting structure comprising:

a plurality of optical elements;

a plurality of first supporting members for respectively supporting the plurality of optical elements; and

a plurality of second supporting members for respectively supporting the plurality of first supporting members via structures having elasticity in the radial direction of the optical element,

wherein the elastic member is made from a plate-shaped spring member in which both ends of the spring member are connected to the first supporting member and the central portion thereof is connected to the second supporting member, and wherein a plurality of the plate-shaped spring members are arranged in the periphery of the first supporting member at substantially equal intervals.



48. (Original) A structure according to Claim 34, wherein the elastic member is made from the same material as that of the first supporting member.

49. (Original) A structure according to Claim 34, wherein the optical element is one of a lens, a mirror, and an optical element to which diffraction is applied.

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50. (Currently Amended) An exposure apparatus comprising:

an illuminating optical system for illuminating a reticle with a light beam from a light source; and

a projection optical system for projecting a light beam from the reticle on a wafer, wherein at least one of the illuminating optical system ~~and/or~~ and the projection optical system have a supporting structure for supporting an optical element according to Claim 34.

51. (Currently Amended) A method for manufacturing semiconductor devices, said method comprising:

performing an exposing step by an exposure apparatus according to Claim 50.

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52. (New) An exposure apparatus comprising:

an illuminating optical system for illuminating a reticle with a light beam from a light source; and

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a projection optical system for projecting a light beam from the reticle on a wafer,  
wherein at least one of the illuminating optical system and the projection optical  
system have a supporting structure for supporting an optical element according to Claim 47.

53. (New) A method for manufacturing semiconductor devices, said method comprising:  
performing an exposing step by an exposure apparatus according to Claim 52.
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